REVISED LIST OF THE PRESERVED MATERIAL OF THE EXTINCT CAPE COLONY QUAGGA, *EQUUS QUAGGA QUAGGA* (GMELIN)

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(With 25 figures)

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Contents

Introduction

Much has been written about the reason for the extinction of the quagga, *Equus quagga quagga* (Gmelin 1788). It is usually attributed to 'ruthless' hunting and even 'planned extermination' by the colonists of the bigger herbivorous animals, as these were considered to be competing against their livestock for grazing. The quagga, which existed in large numbers, is also said to have been hunted for its flesh, which the farmers fed to their labourers, and its skin, which was used for grainbags and leather. Because of the great demand in the hide trade for skins of quagga, zebra and other game, the farmers of the Orange Free State in the eighteen-sixties organized hunting expeditions to collect them. Wagon-loads of prepared skins were driven to the coast for sale (Bryden 1889: 401).

Eloff (1966) sees the reason for the extinction of the quagga in 'an ever greater pauperised gene pool relative to further migration southward, with decreasing adaptability to changed environmental conditions'.

The quagga had a comparatively small range, which is a known factor in the elimination of endemics. In addition, its range was restricted by farm fences (Jackson 1920), which separated groups and individuals from one another.

While the above factors may all have contributed to the disappearance of the quagga, there are another two which have not been mentioned by previous authors.

South Africa was for a long time known as a 'hunting paradise'. Many books, e.g. *Portraits of the game and wild animals of southern Africa* (Harris 1840), give evidence of the senseless mass killing by those privileged to journey to the Cape of Good Hope to satisfy their hunting urges. The quagga obviously experienced this onslaught.

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The second factor was the years of drought, experienced after 1876, which could have been the final *coup de grâce* for the species. In his *Manna in the desert*, Alfred de Jager Jackson (1920) recalls his younger days on a Great Karroo farm near Nelspoort (the area from which the Cape Town quagga foal originated). He writes (p. 73): 'The last years of my life on the Karroo farm were clouded and sad. I would not care to live them again. As I have said, the good seasons ended in 1876. The year following was a time of dread disease and drought. The carcasses of thousands of dead animals lay rotting over the land.'

It has however also been stated that the species vanished without this fact having been noticed by zoologists. In Afrikaans the word 'Kwagga' was, and still is, used for the true quagga and for both plains zebra and the mountain zebra. Outside the Cape Colony 'Quagga', in its various spellings, implied *Equus quagga quagga* only. The first indigenous equids which the white settlers in South Africa became acquainted with were the true quagga and the mountain zebra. They referred to these as 'Kwagga', 'Wilde-esel' or 'Wildeperd', 'Gestreepte-esel' or 'sebra' (Scholtz 1941). With their advance in a northerly direction, the colonists met with Burchell's zebra, which they called the 'Bontkwagga'. Unfortunately in common usage in South Africa the 'Bont' is often dropped and 'Kwagga' was and still is 'good enough' to describe any striped equid.

It appears to be largely this confusion which led to the accidental disappearance of the quagga. Had the true situation been realized, when the quagga became rare in the middle of last century, efforts might have been made to protect the species in its native country and to breed from those in European zoos. (It should be noted that as early as 1822, when the need to protect the bontebok, *Damaliscus dorcas dorcas* (Pallas), was realized, this antelope was excluded from otherwise unspecified hunting licences, issued by the Colonial Office in Cape Town.)

Although it cannot be determined when the last indigenous quaggas disappeared, it is generally accepted that the female specimen which died at Amsterdam Zoo on 12 August 1883 outlived those in South Africa. A letter dated 6 November 1856 from A. Dale, Beaufort West District, to the director of the South African Museum states that 'Quaggas seem to be rather scarce', yet Mr Bols, the Belgian Consul at Port Elizabeth, still obtained 'several' quaggas in 1870; these were sent to Antwerp Zoo.

Several authors have discussed the striping and coloration of the quagga. Old descriptions and illustrations which were made from living specimens refer to animals with black or dark stripes on a brown or fawn base, while the legs and ventral surface are given as white or whitish. Later authors declare that these early descriptions were incorrect, due to carelessness, incompetence and inaccurate observation, and describe the quagga as dark brown, chestnut or fawn coloured with white or whitish stripes, restricted to the antero-dorsal region of the animal, while other zebra forms are described as being light with black-brown stripes. If the quagga is indeed a light-striped animal, how can the

presence of dark stripes or stripe fragments, posterior to the 'light-striped' portion and above the hooves, be explained?

With this in mind all quagga skin material in Europe, except for the foetus in Stockholm, the 'Elgin head' together with a mounted skin in Edinburgh and the material possibly existing in Russia, was examined by the author in 1971.

In common practice, the part which covers the smaller percentage of a bi-coloured surface is called the 'pattern'. The quagga has retained light interspaces on the anterior portion of the body. These interspaces are, in contrast to other members of the plains (or Burchell's) zebra group, only half, or less than half, as wide as the stripes. As these light regions cover a lesser proportion of the animal than the dark, it has in publications of this century been described as a light-striped animal.

As an adaptation to open country, the plains zebra group, including the quagga, exhibits progressive reduction in striping and contrast between stripes and interspaces from the north to the south of its range, i.e. the white darkens towards brown, the black lightens to a brown. This process, which commences from the hooves and from the buttocks, culminates in the disappearance of stripes.

The quagga represents the extreme limit of this trend. The unstriped postero-dorsal region of the animal is of a brown tone, which is intermediate between the light and dark colours of the clearly striped antero-dorsal region.

The difference in coloration between northern and southern sub-species of plains zebra appears to have been achieved by changing the pigment distribution. It seems therefore that in the quagga the proportion of light and dark pigments is the same as in other members of the plains zebra group.

Examination of single hairs from various portions of the quagga reveals that the areas between striped and unstriped regions are occupied by multi-coloured hairs. Each hair shows light and dark transverse sections, similar to the colour pattern of individual porcupine quills. Hairs from faint stripes have a higher proportion of dark sections than hairs from the interspaces. The interspaces, which show progressive darkening towards the posterior region of the animal, may be distinguished, even in the regions with faint stripes or stripe fragments, by their lighter colour. Hairs from other parts of the body are uniform in colour and are light, dark or of intermediate tone, according to their position. This type of pigmentation is particularly obvious in the Berlin, Vienna and Amsterdam specimens.

Parallel with this reduction of contrast and striping is the occurrence and progressive intensification of shadow-stripes (darkish streaks within the interspaces). In southern forms of the plains zebra this has reached the stage where, on the buttocks, it has become difficult to distinguish stripes from shadow-stripes.

In the quagga this has been carried further. The region anterior to the unstriped area is covered with numerous narrow, dark stripes or stripe fragments, about twice the number as in the similar region of a plains zebra. Some

of these narrow bands are obviously stripes while others are shadow-stripes. This can be seen clearly in the Basle and Paris specimens.

The next stage in this process appears to be the fusion of shadow-stripes with the true stripes, which produces the wide stripes characteristic of the quagga. Often fragments of interspaces are retained, forming light dots or streaks within the stripes. In regions where there is little fusion between fragments of stripes and shadow-stripes, a dappling effect is often produced. This has presumably led to illustrations like the one by Ridinger.

Whether the quagga represents a species or subspecies, and whether differentiation by colour characteristics can be applied, have been much discussed. Hilzheimer (1912) considered that the narrow interspaces (hell gestreift) were diagnostic. He therefore accepted the Wiesbaden specimen as a true quagga, although he could not fit this specimen into the stripe-reduction sequence suggested by Ridgeway (1909).

At first sight, the narrow interspaces and very reduced body striping appear to be characteristic of the quagga, as is the reduced striping on the face (between eye and corner of mouth) and broad dorsal median stripe, together with its indicated or continuous flanking band on each side. However, all these characters are variable and are independent of one another. On the basis of only one of these four colour characteristics there is no sharp division between *Equus q. burchelli* and *Equus q. quagga*. The preserved quagga specimens continue the gradual change in colour and in marking shown by the north to south colour variants of the plains zebra group. The advanced example would have no facial striping, body stripes terminating at the shoulder, interspaces one-third or less the width of the stripes, and a broad dorsal median stripe with a continuous flanking band on each side.

Because of missing markings below the fork of the shoulder-stripe and below the last body stripe, Hilzheimer (1912) erected the subspecies '*paucistriatus*' of *Equus burchelli*, for two of the four Mainz specimens. (He considered that the 'lack' of the ventral median stripe in the type might be characteristic, but traces of this stripe can still be seen in the specimen. The Darmstadt and Munich specimens also show this and there is no doubt that the 'absence' of the ventral median stripe must be attributed to taxidermy. Furthermore the second specimen of '*Equus burchelli paucistriatus*' in Mainz possesses a ventral median stripe.)

If *Equus quagga quagga* can be identified by the presence of at least two of the four characteristics, then the long-haired female '*Equus burchelli paucistriatus*' at Mainz is a true quagga, since it possesses narrow interspaces, faintly striped face and broad dorsal median stripe, flanked with almost continuous bands. Similarly the specimens at Tring and Vienna must be identified as *Equus quagga quagga*. The former has a faintly striped face and broad dorsal median stripe, flanked with interrupted light bands. The latter, in spite of marking below the shoulder-stripe fork and last body stripe has narrow interspaces and a broad dorsal median stripe, flanked with interrupted light bands. These

specimens represent the variation of the quagga closest to *Equus q. burchelli*, while the type of '*Equus burchelli paucistriatus*' represents the variation of *Equus q. burchelli* closest to *Equus q. quagga*. Thus the museum at Mainz has three true quaggas, as suggested by Schwarz (1912), and also, of the preserved specimens of *Equus q. burchelli*, the closest to the true quagga.

To summarize, the colour and markings of the preserved quagga specimens do not support the identification of the quagga as a separate species, as suggested by the following authors, some of whom have studied skulls and skeletons as well: Hilzheimer (1912), Cabrera (1936), Allen (1939, 1945), Cooke (1943), Lundholm (1951), Roberts (1951), Ellerman *et al.* (1953), Meester (1964), Ansell (1967).

The question has been raised as to whether or not the colour and pattern variation within the preserved quagga skins represents geographical forms. As only a few skins have precise locality data, this has remained unanswered. However, Antonius (1931) concluded that quaggas with both few and many stripes might have occurred throughout the distribution area. This seems to be confirmed by the following extract from a letter dated 11 June 1857 (1858) to the director of the South African Museum from A. Dale of Kampherskraal at 'Nell's Poort' (Beaufort West District) announcing the arrival of the Cape Town foal: 'I believe there are two kinds, the stripes of the one kind being more indistinct and of much paler colour than those of the other: this is a specimen of the dark striped kind; the one which the Governor possesses and which was reared at Nell's Poort is of the other description.' (Dale's differentiation might be due to the much darker appearance of a less striped animal compared with a more extensively striped individual.) The colour variation within the preserved skins, where not due to fading or individual variation, could however also be the result of seasonal changes.

An interesting point arises in connection with the Governor Sir George Grey's specimen. On 4 September 1858 he donated a quagga to London Zoo, Regent's Park. This male, of which a high-quality drawing by H. Weir appeared in *Illustrated London News*, volume 33, 6 November 1858, had to be killed because of self-inflicted injury on 10 June 1864. The mounted skin and skeleton at the British Museum (Natural History), London, which were entered in the catalogue on 2 July 1864, were regarded as those of Grey's animal. However, I have examined the skin and have found it to be that of a female, while the skeleton is that of a male, if the presence of large canines can be accepted as a means of identification. The shattered left metacarpal, as Dr A. W. Gentry of the British Museum pointed out to me, seems to indicate that the skeleton at least is of Grey's animal. It is feasible that when Grey's animal became available in 1864 the British Museum decided to buy a more characteristic and already stuffed skin from the Zoological Society's Museum, which was most likely that of the first London Zoo specimen which had died in 1834 (Shortridge 1934) and to obtain or keep only the skeleton of Grey's animal.

In trying to identify the illustration of Grey's animal with one of the stuffed

skins of which no data are available, the following became evident. Grey's animal was peculiar in having fragments of transverse stripes on the rump, resembling the gridiron pattern of *Equus zebra*. This atypical marking is found only in the Wiesbaden specimen, a male, and it is considered that this specimen is the skin of Grey's animal. Furthermore, the Wiesbaden specimen apparently does not contain a skull or footbones (a practice unusual in taxidermy at that time), and the skin is repaired in the area of the left metacarpal, the region of the self-inflicted injury. The Wiesbaden specimen was bought from the dealer Frank of Amsterdam in 1865. It is known that Frank dealt in quagga material with the dealer Edw. Gerrard of London (Tring specimen), but no records of transactions regarding Grey's dead animal, nor of its disposition by the London Zoo, could be traced.

Although the Governor did have a private menagerie at Cape Town (Anon 1858), there are no records of any other quaggas in it. If the above assumption is correct and the Governor's quagga referred to by Dale was the male donated to London Zoo, i.e. the Wiesbaden specimen, then there is confirmation that the two extreme forms of quagga, as exemplified by the Cape Town and Wiesbaden specimens, occurred in the same locality.

Mention should also be made of the second London Zoo quagga (1851–72), a female, which is the only quagga ever photographed alive in Europe. According to previous authors the skin of this animal was not preserved, as it was bad (Ridgeway 1909). However, comparison of the photographs with the stuffed specimen in the Royal Scottish Museum, Edinburgh, reveals that the two are one and the same specimen. It appears, therefore, that the skin was not discarded, but was sold to the Museum in 1879 by Edw. Gerrard. The skeleton of this specimen has recently been discovered in the collection of the Peabody Museum of Natural History, Yale University (Willoughby 1966).

The locality given for the Leiden quagga—Steenbergen, Cape Colony—is incorrect. The position of the only 'Steenbergen' ever recorded is in the Cape Peninsula, well outside the known distributional range of the quagga. This mistake apparently stems from one of the two labels included with this specimen. The two labels give different data: (i) 'obtained alive in 1826'; (ii) '15th June, 1827—Steenbergen'. As can be seen below, neither of the labels is likely to apply to this specimen. It is possible that (i) refers to the female specimen discussed below, while (ii) probably refers to a male mountain zebra specimen (*Equus zebra*) sent to Leiden in conjunction with a quagga. This mountain zebra could well have been collected at Steenbergen.

During the years 1827–33, the Cape Town based medical doctor and agent for the Rijksmuseum van Natuurlijke Historie in Leiden, H. B. van Horstok, sent three quagga specimens to Leiden. The first, a female, he obtained alive, but unfortunately the animal died before shipment, so that only its skin and skeleton were sent to Leiden, as announced in Van Horstok's letter to the director, dated 1 July 1827. The second specimen, a male, together with a male mountain zebra, was shipped on the frigate *Bellona* and was received by the

director of the navy in Holland in July 1830. The third specimen, of indeterminate sex, which Van Horstok obtained from 'Graaf Reinjet' on 25 March 1831 was dispatched to Leiden on or about 20 May 1833, the date of the letter which announced the dispatch.

As far as is known, the Rijksmuseum van Natuurlijke Historie handled only these three quaggas of which there are today only one mounted stallion and a skeleton at Leiden. However, the immature quagga skeleton at Berlin is said to have been exchanged with the Rijksmuseum van Natuurlijke Historie in 1833–8 (Opperman 1970).

The policy at the Rijksmuseum van Natuurlijke Historie at that time was to keep a perfect male, female and juvenile specimen of every species and to exchange or sell any additional or imperfect specimens. (Van Bruggen, personal communication.)

On 3 August 1830 a quagga (skin and male skull) was dispatched from Leiden to the Senckenberg Museum in Frankfurt, where it was received in 1831.

Renshaw (1904) suggested the possibility that the Turin specimen may have been collected by Van Horstok. This female specimen, which was bought in 1827 by the Turin museum from the dealer S. Leadbeater of London, is damaged and has a sewn cut on the right side of the dorsal median stripe. These facts, when considered in the light of the policy of the Rijksmuseum van Natuurlijke Historie, appear to suggest that the Turin specimen might be the first (female) Leiden quagga. It is however difficult to imagine that the specimen which arrived in Holland probably late in 1827 could have been mounted, sold to Leadbeater and from there to Turin, all within that year.

Unfortunately no certainty about the Leiden quaggas could be reached.

The history of the Tring specimen must be mentioned. On 2 April 1842 Lord Derby requested a live male quagga from his Cape Town agent, the Reverend John Fry (xerox copy of letter at the South African Museum, Cape Town). Lord Derby had at his Knowsley menagerie a female quagga, which might have been obtained from Fry. After Derby's death his animals were sold in 1851. It appears that the male quagga had died previously. The female was sold to Amsterdam Zoo, and was stuffed when it died there in 1853. After the last living quagga had died in 1883 and been mounted, the Amsterdam Museum may have sold its earlier specimen to the dealer Frank of Amsterdam, who is known to have bought a mounted quagga as a 'duplicate from a continental museum' (Renshaw 1904). Frank sold this specimen to Edw. Gerrard of London, who re-mounted it and sold it in 1889 to Lord Rothschild of Tring. That the Tring specimen might in fact be the Knowsley female seems proven by the specimen's old label 'From E. Gerrard, Jun., 61 College Place, Camden Town, London—Quagga Equus quagga Linn. Gray Knowsley Menagerie—South Africa'. Supporting this is the resemblance between the Tring specimen and the animal on the right in Hawkins's drawing (Gray 1850) of the live Knowsley quaggas. It is obvious that the artist did not make a completely correct picture, nevertheless characteristics like the big light patch in one of the last of the

body stripes on the left and the dorsal forking of some body stripes are found in both.

Although there have been attempts to breed quagga in captivity there are apparently no records of this. However there are records of the birth of quagga hybrids (Wagner 1835; Renshaw 1904, 1935) with either a male or female quagga parent. In one instance, the female horse-quagga hybrid proved to be fertile and was crossed with an arab stallion, the resulting offspring resembling the quagga in its mane and body striping (Wagner 1835).

None of these hybrids is preserved, but according to descriptions they differed from hybrids of other zebra forms. These have clear, zebra-like leg striping while the quagga hybrids have few leg stripes, mainly at the 'knees' and 'hocks', and striping on the neck and shoulder. This leg striping in the hybrids, which should not be confused with faint markings just above the hooves, traceable in most preserved quagga skins, is interesting since the quagga parent in each case must have had plain coloured legs.

The stuffed equid foal in the Museum and Art Gallery at Doncaster, Yorkshire, which has not been previously recorded in the literature, exhibits the characteristics of quagga hybrids. It appears to be the only quagga hybrid skin still in existence. While the label on the outside of the original showcase reads: 'Zebra-foal born at Owston, 1st April 1830', there is an old label attached to the specimen, naming it as a 'cross between a male ass and a female quagga'. This foal in its case was donated to the museum by the Davies-Cooke family in 1923. Phillip Davies-Cooke brought a 'zebra' from the Cape in the early nineteenth century. This animal was in all probability the mother of the foal which is now in the Doncaster Museum. The skeleton which Davies-Cooke donated to the Yorkshire Philosophical Society in 1841 is most probably that of the mother.

Two further unusual equid hybrids, both with the same parents, are preserved in the Tring Museum. They were born in Lord Rothschild's menagerie at the end of the nineteenth century and are the result of a cross between a male horse and a female Burchell's zebra. Their striping is similar to that of the foal at Doncaster, but is more intensive and extends further posteriorly. The larger of the two shows quite strong but narrow dark stripes on the buttocks. It seems quite likely that their mother was in fact a specimen of *Equus quagga burchelli*.

LIST OF INSTITUTIONS HOUSING QUAGGA MATERIAL

Some inaccurate statements concerning the preserved quagga material are to be found in the literature, including the lists by Renshaw (1904), Ridgeway (1909), Hilzheimer (1912), Harper (1945) and Rzasnicki (1949); these errors are corrected in the following list. The osteological material not belonging to skins is listed without guarantee of correct identification and is based only on information given by the institutions concerned or previous authors.

Place	Sex	Skin	Complete skeleton	Skull	Loose bones	Institution	Address
Amsterdam	♀	+	–	+	–	Zoölogisch Museum	Plantage Middenlaan 53 Amsterdam-C Netherlands
Bamberg	♀?	+	–	+	–	Naturkunde Museum	Fleischstrasse 2 D-86 Bamberg W. Germany
Basle	♀	+	–	+	+	Naturhistorisches Museum	Augustinergasse 2 CH-4051 Basle Switzerland
Berlin	♀	+	–	+	–	Museum für Natur-	Invalidenstrasse 43
	♂	–	–	+	–	kunde an der	X-104 Berlin
	juv.	–	+	–	–	Humboldt Universität	Germany
Bristol*	♂	–	–	+	–	City Museum, Department of Natural History	Queen's Road Bristol BS8 1RL England
Cape Town	♀ foal	+	–	+	+	South African Museum	Queen Victoria Street P.O. Box 61, Cape Town, South Africa
Darmstadt	♀	+	–	–	–	Hessisches Landes-museum, Zoologische Abteilung	Friedensplatz 1 D-61 Darmstadt W. Germany
Edinburgh	?	head	–	(+)	–	Royal Scottish	Chambers Street
	♀	+	–	–	–	Museum	Edinburgh EH1-1JT Scotland
Frankfurt	♂	+	–	+	–	Natur Museum Senckenberg	Senckenberg-Anlage 25 D-6 Frankfurt/Main 1 W. Germany
Kazan		+				Zoological Museum	University Kazan, USSR
Leiden	♂	+	+	–	–	Rijksmuseum van Natuurlijke Historie	Raamsteeg 2 Leiden, Netherlands
London	♀	+	–	–	–	British Museum	Cromwell Road
	♂	–	+	–	–	(Natural History)	London SW7 5BD England
London	♀	–	+	–	–	University College, Department of Zoology	Gower Street London WC1E 6BT England
Mainz	♂	+	–	–	–	Naturhistorisches	Reichklarastrasse 1
	♀	+	–	–	–	Museum	D-65 Mainz
	foal	+	–	(+)	–		W. Germany
Milan	♀ imm.	+	–	(+)	–	Museo Civico di Storia Naturale	Corso Venezia 55 I-20121 Milan Italy
Munich	♀	+	–	‡	–	Zoologische Samm-	Schloss Nymphenburg
	♀	–	–	+	–	lung des Bayerischen	Nordflügel
	♂	–	–	‡	–	Staates	D-8 Munich 19 W. Germany
New Haven	♀	–	+	–	–	Peabody Museum of Natural History, Yale University	New Haven Conn. 06520, U.S.A.

* See footnote on page 57.

Place	Sex	Skin	Complete skeleton	Skull	Loose bones	Institution	Address
Paris	♂	+	+	—	—	Museum National d'Histoire Naturelle, Laboratoire de Mammalogie	55 rue de Buffon Paris—5e France
Philadelphia	♂	—	+	—	—	The Academy of Natural Sciences	Nineteenth and the Parkway Philadelphia Penn. 19103, U.S.A.
Pretoria	♀	—	—	+	—	Transvaal Museum	Paul Kruger Street PO Box 413 Pretoria, Transvaal South Africa
Stockholm	foetus	+	—	—	—	Naturhistoriska Riksmuseet	Roslagsvägen 124 S–104 05 Stockholm 50 Sweden
Stuttgart	♀	—	—	+	—	Staatliches Museum für Naturkunde	Schloss Rosenstein D-7 Stuttgart 1 W. Germany
Turin	♀	+	—	+	—	Museo e Instituto de Zoologia Sistematica	Via Gioletti 34 I—10123 Turin Italy
Tring	♀	+	—	—	—	Zoological Museum (affiliated to the British Museum (Natural History))	Akeman Street Tring, Herts. England
Tübingen	♂	—	—	+	—	Zoologisches Institut der Universität	D-74 Tübingen W. Germany
Vienna	♀	+	—	—	—	Naturhistorisches Museum	Burgring 7 A-1014 Vienna 1 Austria
Wiesbaden	♂	+	—	—	—	Städtisches Museum, Naturwissen-schaftliche Abteilung	Rheinstrasse 10 D-62 Wiesbaden W. Germany

\+ = present; — = not present;
(+) = present in mount; ‡ = incisivae only.

LOST MATERIAL

Rzasnicki (1949) expressed the fear that a post-war inventory of quagga material might reveal many losses. The following specimens have indeed been lost, in some cases as a direct consequence of World War II.

AMSTERDAM: A female quagga skeleton was mounted for the Amsterdam museum; the whereabouts of the specimen are unknown (Tuijn 1966).

GRAHAMSTOWN: The quagga skull was destroyed by fire in 1942.

KOENIGSBERG: The mounted specimen was lost when 'Waldhof', a near-by castle used for safe storage by the museum, was burnt down at the end of the war.

LONDON: The two male skulls, housed in the Royal College of Surgeons, were destroyed during the bombing raids on that city.

MAINZ: The foal was partly destroyed by fire during World War II. Only the head, front legs and rump with hind legs and tail have been salvaged. Schwarz (1912) mentioned a male quagga skull as being in the collection of the Naturhistorisches Museum. This skull no longer exists nor are there any records of it.

MANCHESTER: Renshaw (1904) lists a quagga skeleton at the medical museum of the University. This specimen no longer exists, nor are there any records of its fate.

STUTTGART: Although Hilzheimer (1912) has described and figured quagga foot and leg bones housed in Stuttgart, these bones no longer exist nor is there any record of their disposition. The bones belonged either to the skin sent from Cape Town in 1827 by Von Ludwig to Tübingen or to the Amsterdam specimen.

YORK: A quagga skeleton was donated to the Yorkshire Philosophical Society (*Annual Report* 1841) by Ph. Davies-Cooke. The specimen no longer exists, nor are there any further records.

DESCRIPTION OF PRESERVED MATERIAL

EXPLANATION OF TERMS

Face: area between eye and corner of mouth

Interspace: light portion of colour pattern

Stripe: dark portion of colour pattern

Head–body: following contour of dorsal mid-line, except for portion between upper lip and posterior margin of nostrils and middle of rump to extreme posterior margin of buttocks, where the ruler remained straight. From anterior end of muzzle and posterior end of buttock a line to meet ruler in a 90° angle was imagined

Tail: from where it leaves body to flesh tip, leaving out the brush

Ear: along mid-line of outer surface, from head to tip

Hindfoot: along lateral side from 'sole' of hoof to middle of fetlock, from there to middle of heel

Shoulder height: vertically from base to highest point of withers

All measurements were taken by the author except for the specimens at Edinburgh, Doncaster and Stockholm.

Bones belonging to skins: not listed separately.

Bones belonging to skins but at different institutions: listed separately.

The references cited exclude the numerous illustrations, with or without short notes, when these contribute no specific information.

The type of *Equus burchelli paucistriatus* (Hilzheimer 1912) is included as the coloration of the specimen is intermediate between that of *Equus quagga burchelli* and *Equus quagga quagga*. It was considered synonymous with the true quagga by Allen (1939). The foal at Doncaster is included, as it appears to be the only quagga hybrid preserved.

AMSTERDAM—mounted skin and skull

FIG. 1. Amsterdam quagga.

Catalogue number: ZMA 522

Sex: female

Locality: ——

Date of acquisition: 1883

Remarks on acquisition: animal lived at Amsterdam Zoo, 9 May 1867–12 August 1883

History of mount: original mount by Inspector Kerz (Hilzheimer 1912: 91)

Description of striking features: face fairly striped; light flanking bands of dorsal median stripe not interrupted; hair very short, transversely multicoloured in some regions; dark portions of animal umber, not the usual chestnut colour

Measurements: head–body: 2,28 m
tail: 0,46 m
ear: 0,16 m
hindfoot: 0,46 m
shoulder height: 1,20 m

State of preservation: very good

Further material of same individual: skull in collection. It appears from Hilzheimer (1912: 98) that the foot bones of this specimen were at Stuttgart but they are no longer there, nor is there any record of them

Remarks: not exhibited

References: Lydekker (1904); Renshaw (1904); Ridgeway (1909); Hilzheimer (1912); Griffini (1913); Antonius (1931); Van Bruggen (1959)

BAMBERG—mounted skin

FIG. 2. Bamberg quagga.

Catalogue number: 236 (mammal catalogue)

Sex: female?

Locality: ——

Date of acquisition: 9 November 1858

Remarks on acquisition: bought as stuffed specimen from Dr F. Krauss, Stuttgart (Antonius 1931)

History of mount: re-mounted in 1969 by dermo-sculptor Kaestner, Berlin

Description of striking features: face unstriped; light flanking bands of dorsal median stripe not interrupted

Measurements:

head–body:	1,935 m
tail:	0,410 m
ear:	0,165 m
hindfoot:	0,490 m
shoulder height	1,100 m

State of preservation: good

Further material of same individual: ——

Remarks: exhibited open; alien matter used for improvement

References: Schwarz (1912); Antonius (1931)

BASLE—mounted skin, skull and foot bones

FIG. 3. Basle quagga.

Catalogue number: 897

Sex: female

Locality: received from Shiloh/Whittlesea, Eastern Cape Province

Date of acquisition: 1862/63

Remarks on acquisition: donated by missionary S. Gysin at Shiloh

History of mount: re-mounted in 1929 by dermo-sculptor G. Ruprecht

Description of striking features: face faintly striped near eye; light flanking bands of dorsal median stripe several times interrupted in anterior portion

Measurements:

head–body:	2,14 m
tail:	0,38 m
ear:	0,15 m
hindfoot:	0,47 m
shoulder height:	1,20 m

State of preservation: good

Further material of same individual: skull (No 2860) and skeletal parts (No 8099, 10304) in collection

Remarks: exhibited

References: Ridgeway (1909); Roux (1910); Griffini (1913); Antonius (1931)

BERLIN—mounted skin and skull

FIG. 4. Berlin quagga.

Catalogue number: 4832 (old number: A1133)

Sex: female

Locality: ——

Date of acquisition: 1867

Remarks on acquisition: animal lived at Berlin Zoo, 1863–7

History of mount: original mount (stuffed with straw)

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe not interrupted; animal very dark; hairs of faint striped regions with light and dark transverse sections

Measurements:

head–body:	2,20 m
tail:	0,35 m
ear:	0,15 m
hindfoot:	0,47 m
shoulder height:	1,11 m

State of preservation: good, probably not faded

Further material of same individual: skull in collection

Remarks: not exhibited

References: Renshaw (1904); Ridgeway (1909); Hilzheimer (1912); Antonius (1931, 1951); Opperman (1970); Liversidge & ffolliott (1971)

BERLIN—skeleton

Catalogue number: 38954 (old number: An 8954)

Sex: immature

Locality: ——

Date of acquisition: 1833–8

Remarks on acquisition: from anatomical collection J. Müller, exchanged with Rijksmuseum van Natuurlijke Historie, Leiden

Further material of same individual: ——

References: Renshaw (1904); Ridgeway (1909); Hilzheimer (1912); Antonius (1931); Opperman (1970)

BERLIN—skull

Catalogue number: 23707 (old number An 1407)

Sex: male

Locality: ——

Date of acquisition: 1833–8

Remarks on acquisition: from anatomical collection J. Müller

Further material of same individual: ——

References: Renshaw (1904); Ridgeway (1909); Hilzheimer (1912); Antonius (1931, 1951); Opperman (1970)

BRISTOL—skull*

Catalogue number: Aa 3294

Sex: male

Locality: ——

Date of acquisition: probably 1927

Remarks on acquisition: registered 1927

State of preservation: right PM_1 missing

Further material of same individual: ——

CAPE TOWN—mounted skin, skull and footbones

FIG. 5. Cape Town quagga foal.

Catalogue number: SAM 35575

Sex: female, foal

Locality: Nelspoort, Beaufort West District, Cape Province

* In January 1974, while this paper was in press, Dr A. W. Gentry identified this skull as that of *Equus caballus*.

Date of acquisition: 1857–60

Remarks on acquisition: donated by A. Dale of Campherskraal, Nelspoort; animal lived one week after capture

History of mount: stuffed with hemp and clay at South African Museum; re-mounted by dermo-sculptor R. Rau 1969/70

Description of striking features: specimen with long, woolly fur (25–30 mm long); face faintly striped; light flanking bands of dorsal median stripe inconspicuous, not interrupted

Measurements:

head–body:	1,240 m
tail:	0,280 m
ear:	0,123 m
hindfoot:	0,390 m
shoulder height:	0,770 m

State of preservation: good, partly moth-eaten

Further material of same individual: skull, footbones and fleshy parts of skin, all removed during re-mounting, in collection

Remarks: exhibited; since 1962 in special fade-ban glass case

References: Renshaw (1904, 1909); Ridgeway (1909); Antonius (1931); Shortridge (1934)

DARMSTADT—mounted skin

FIG. 6. Darmstadt quagga.

Catalogue number: HLM, M719

Sex: female

Locality: ——

Date of acqisition: 1830

Remarks on acquisition: skin obtained from Stuttgart Museum (Scheer *in lit.* 1959); may possibly be the skin received in 1827 from Baron C. F. H. von Ludwig of Cape Town (Hilzheimer 1912)

History of mount: re-mounted in 1862 by Inspector Kerz (Hilzheimer 1912)

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe twice interrupted; ventral median stripe lost through taxidermy, except for anterior portion

Measurements:

head-body:	2,260 m
tail:	0,520 m
ear:	0,165 m
hindfoot:	0,500 m
shoulder height:	1,200 m

State of preservation: good

Further material of same individual: it is likely that the skull at Stuttgart belongs to this animal

Remarks: exhibited

References: Hilzheimer (1912)

DONCASTER—mounted skin

(Hybrid *Equus q. quagga* ♀ & *Equus asinus* ♂)

FIG. 23

Catalogue number: 108.26

Sex: foal

Locality: born at Owsten, Yorkshire, 1 April 1830

Date of acquisition: 1923

Remarks on acquisition: foal died soon after birth; mounted by Hugh Reid, Doncaster, for Phillip Davies-Cooke, whose family donated it to the museum

History of mount: original mount

Description of striking features: faint striping traceable in most parts; several stronger stripes at withers and legs below 'knee' and 'hock', tail with long hair from the root, lower portion forming brush; mane and tail uniformly dark

Measurements: head–body: 1,170 m
tail: 0,280 m
ear: 0,105 m
hindfoot: 0,400 m
shoulder height: 0,780 m

State of preservation: good, probably faded

Further material of same individual: ——

EDINBURGH—mounted skin

FIG. 7. Edinburgh quagga.

Catalogue number: 1879.35.1

Sex: female

Locality: ——

Date of acquisition: 1879

Remarks on acquisition: bought from Edw. Gerrard, London; skin of London Zoo female, 15 March 1851 to 7 July 1872

History of mount: original mount

Description of striking features: face fairly striped; light flanking bands of dorsal median stripe not interrupted

Measurements:

head–body:	2,205 m
tail:	0,400 m
ear, left:	0,150 m
ear, right:	0,145 m
hindfoot:	0,430 m
shoulder height:	1,170 m

State of preservation: good

Further material of same individual: skeleton at Peabody Museum of Natural History, Yale University, New Haven, U.S.A.

Remarks: Specimen is second Royal Scottish Museum quagga; first specimen (bought 1813, not 1818 as stated in the literature) no longer exists

References: Renshaw (1904); Ridgeway (1909); Antonius (1931)

EDINBURGH—mounted head

FIG. 8. Edinburgh quagga head (formerly Elgin).

Catalogue number: 1970–67

Sex: ——

Locality: King William's Town, Cape Province

Date of acquisition: 1970

Remarks on acquisition: 1861 presented by John Maclean of King William's Town to Elgin and Morayshire Society, Elgin; 1970 sold to Royal Scottish Museum

History of mount: original mount, likely to have originated from complete mount

Description of striking features: face unstriped—probably through fading

Measurements: head, upper lip to between ears: 0,415 m
ear, left: 0,170 m
ear, right: 0,150 m

State of preservation: much faded

Further material of same individual: skull is obviously inside mount

References: Ridgeway (1905, 1909)

FRANKFURT—mounted skin and skull

FIG. 9. Frankfurt quagga.

Catalogue number: 19207

Sex: registered as male, skin has no sexual organs

Locality: ——

Date of acquisition: 1831

Remarks on acquisition: by exchange from Rijksmuseum van Natuurlijke Historie, Leiden; probably one of the three quaggas received by the Rijksmuseum between 1827 and 1833 from their agent at Cape Town, Dr H. B. van Horstok

History of mount: remounted at Frankfurt (Lotichius 1912)

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe, where preserved, only slightly interrupted

Measurements:

head–body:	2,100 m
tail:	0,450 m
ear:	0,145 m
hindfoot:	0,450 m
shoulder height:	1,090 m

State of preservation: good, much patched

Further material of same individual: male skull in collection, occipital missing

Remarks: exhibited

References: Hilzheimer (1912); Lotichius (1912), Antonius (1931)

KAZAN—mounted skin

Catalogue number:

Sex:

Locality:

Date of acquisition: 1843

Remarks on acquisition: bought in Hamburg from a Mr Brandt by Professor Eversman for the Zoological Museum of Kazan University.

History of mount: it appears that this specimen was purchased as an old mount and remounted. In 1969 Mr Zaslavsky remounted specimen again

Description of striking features:

Measurements:

State of preservation:

Further material of same individual:

Remarks: the details given here were supplied to Dr V. Eisenmann, Paris, by Professor V. A. Popov, in charge of the Zoological Museum of Kazan University. No further information could be obtained directly from Kazan.

LEIDEN—mounted skin and complete skeleton

FIG. 10. Leiden quagga.

Catalogue number: 18243 (old number: Cat. Jentink 1892 No. a)

Sex: male

Locality: Cape Colony

Date of acquisition: 1830–3

Remarks on acquisition: specimen is probably the second or third of the three received by the Rijksmuseum van Natuurlijke Historie between 1827 and 1833 from their agent at Cape Town, Dr H. B. van Horstok

History of mount: original mount of straw. Specimen exhibited until 1913, causing slight fading of left side

Description of striking features: face clearly striped; mane hair very short; posterior neck stripes breaking up ventrally; light flanking bands of dorsal median stripe twice slightly interrupted anteriorly; posterior striping forming dappling; body stripes and dorsal median stripe with light streaks and dots; faint dark transverse bands above hooves

Measurements: head–body: 2,000 m
tail: 0,430 m
ear, left: 0,180 m
ear, right: 0,165 m
hindfoot: 0,470 m
shoulder height: 1,100 m

State of preservation: very good

Further material of same individual: complete skeleton in collection

Remarks: not exhibited; housed in total darkness

References: Renshaw (1904); Ridgeway (1909); Antonius (1931); Van Bruggen (1959)

LONDON, BRITISH MUSEUM (NATURAL HISTORY)—mounted skin

FIG. 11. London quagga.

Catalogue number: 1864.7.2.3. (old number: 1449a)

Sex: female

Locality: ——

Date of acquisition: 1864

Remarks on acquisition: it seems probable that this specimen is the first London Zoo quagga, 5 November 1831–4 (Shortridge 1934; Antonius 1931; Sclater 1901). In 1864 the British Museum bought a stuffed quagga from

the museum of the Zoological Society and in the same year received at least the skeleton of the third London Zoo quagga, 4 September 1858–10 June 1864 (Sclater 1901; Renshaw 1904)

History of mount: original mount of straw

Description of striking features: face faintly striped; light flanking bands of dorsal median stripe twice interrupted on left

Measurements:

head–body:	2,400 m
tail:	0,410 m
ear:	0,165 m
hindfoot, left:	0,480 m
hindfoot, right:	0,440 m
shoulder height:	1,180 m

State of preservation: poor, left ear off but present; skin cracked; crude repairs

Further material of same individual: the complete skeleton in the collection, which was believed to belong to this skin, is that of a male and probably that of the third London Zoo quagga whose skin is considered to be the one at Wiesbaden Museum

Remarks: not exhibited

References: Lydekker (1904); Renshaw (1904); Ridgeway (1909); Flower (1929); Antonius (1931)

LONDON, BRITISH MUSEUM (NATURAL HISTORY)—skeleton

Catalogue number: 1864.7.2.3. (old number: 1449a)

Sex: male

Locality: probably 'Nell's Poort', Cape Province

Date of acquisition: 2 July 1864

Remarks on acquisition: live animal received at London Zoo 4 September 1858

State of preservation: left metacarpal shattered

Remarks: it is considered that this skeleton belongs to the mounted skin at Wiesbaden, Germany

References: Sclater (1901); Lydekker (1904); Renshaw (1904); Ridgeway (1909)

LONDON, UNIVERSITY COLLEGE—skeleton

Catalogue number:

Sex: female

Locality:

Date of acquisition:

Remarks on acquisition:

State of preservation: left hind limb and right scapula missing

Remarks: Dr A. W. Gentry, British Museum (Natural History), is of the opinion that the specimen is *Equus quagga quagga*

MAINZ—mounted skin

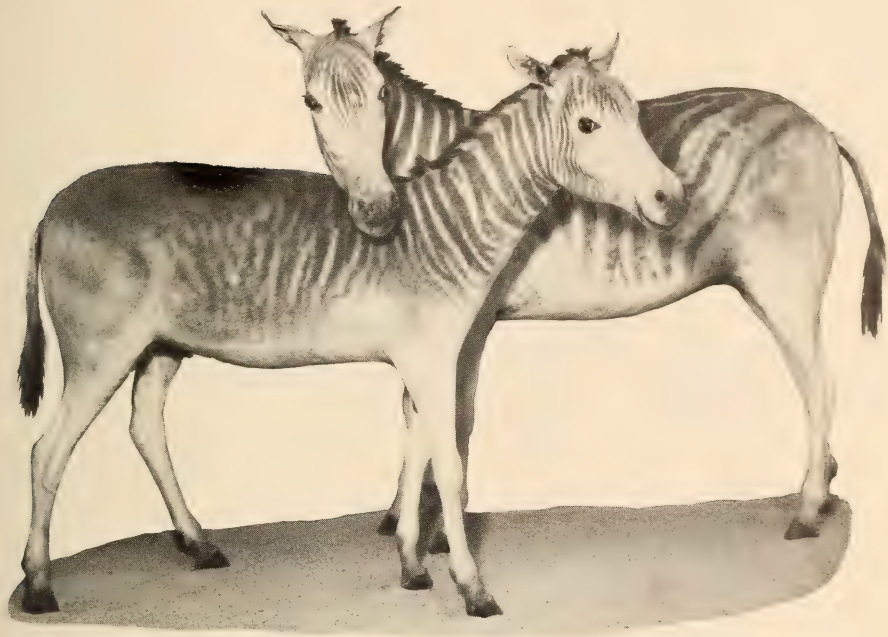

FIG. 12. Mainz, male quagga on left, Burchell's zebra (type of *Equus quagga paucistriatus* Hilzheimer, 1912) on right.

Catalogue number: 1955/13

Sex: male

Locality: ——

Date of acquisition: 1840–50 (Hilzheimer 1912)

Remarks on acquisition: bought from dealer Rühl, Wiesbaden

History of mount: original mount

Description of striking features: face unstriped; light flanking bands of dorsal median stripe several times interrupted; shadow stripes on neck

Measurements:

head–body:	2,020 m
tail:	0,365 m
ear:	0,150 m
hindfoot:	0,440 m
shoulder height:	1,130 m

State of preservation: fair, skin cracked

Further material of same individual: ——

Remarks: exhibited

References: Hilzheimer (1912); Schwarz (1912); Antonius (1931)

MAINZ—mounted skin

FIG. 13. Mainz, female quagga.

Catalogue number: 1955/11

Sex: female

Locality: ——

Date of acquisition: 1840–50 (Hilzheimer 1912)

Remarks on acquisition: bought from dealer Rühl, Wiesbaden

History of mount: original mount

Description of striking features: hair long, woolly; face faintly striped; light flanking bands of dorsal median stripe not interrupted, except for narrow contact with 1st pair of body stripes

Measurements:

head–body:	2,220 m
tail:	0,430 m
ear:	0,135 m
hindfoot:	0,430 m
shoulder height:	1,160 m

State of preservation: fair; skin cracked
Further material of same individual: ——
Remarks: exhibited
References: Hilzheimer (1912); Schwarz (1912); Antonius (1931)

MAINZ—mounted skin

FIG. 14. Mainz, rescued portions of burnt foal.

Catalogue number: 1955/14
Sex: foal
Locality: ——

Date of acquisition: 1840–50 (Hilzheimer 1912)

Remarks on acquisition: bought from dealer Rühl, Wiesbaden

History of mount: original mount

Description of striking features: face faintly striped; hair short

Measurements: head from upper lip to between ears, straight: 0,245 m
tail: 0,190 m
hindfoot: 0,285 m
height at rump: 0,630 m

State of preservation: fair, partly destroyed by fire

Further material of same individual: skull inside mount (occipital burnt)

Remarks: not exhibited

References: Hilzheimer (1912); Schwarz (1912); Antonius (1931)

MAINZ—mounted skin

(Type of *Equus burchelli paucistriatus*)

FIG. 12

Catalogue number: 1955/12

Sex: female

Locality: ——

Date of acquisition: 1840–50 (Hilzheimer 1912)

Remarks on acquisition: bought from dealer Rühl, Wiesbaden

History of mount: original mount

Description of striking features: face clearly striped; interspaces wide with shadow stripes; light flanking bands of dorsal median stripe present from lumbar region only; no markings below shoulder stripe fork and last body stripe

Measurements: head–body: 2,300 m
tail: 0,420 m
ear: 0,165 m
hindfoot: 0,460 m
shoulder height: 1,320 m

State of preservation: fair, skin cracked

Further material of same individual: ——

Remarks: exhibited

References: Hilzheimer (1912); Schwarz (1912); Antonius (1931)

MILAN—mounted skin

FIG. 15. Milan quagga.

Catalogue number: not registered

Sex: female, immature

Locality: ——

Date of acquisition: before 1848 (Sordelli 1909)

Remarks on acquisition: ——

History of mount: original mount

Description of striking features: face unstriped; light flanking bands of dorsal median stripe several times interrupted; coat long and woolly

Measurements:

head–body:	1,820 m
tail:	0,370 m
ear:	0,175 m
hindfoot, left:	0,460 m
hindfoot, right:	0,435 m
shoulder height:	1,020 m

State of preservation: fair, much faded, partly moth-eaten

Further material of same individual: skull or part thereof inside mount, upper and lower incisors visible

Remarks: exhibited

References: Sordelli (1909); Griffini (1913)

MUNICH—mounted skin and incisivae

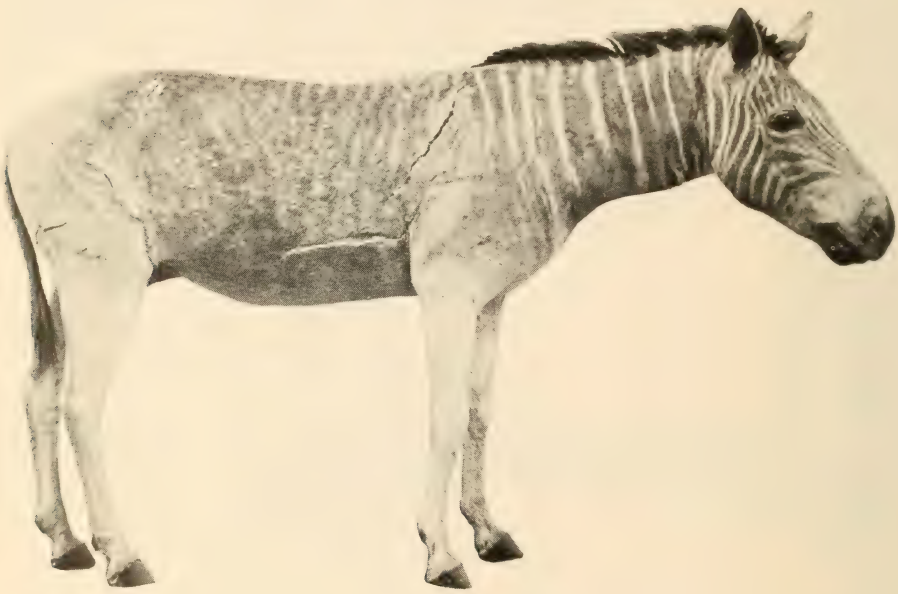

FIG. 16. Munich quagga.

Catalogue number: AM 541

Sex: female

Locality: ——

Date of acquisition: 1834–5

Remarks on acquisition: bought from C. F. Ecklon, Hamburg, probably as unmounted skin

History of mount: mounted or remounted during first decade of this century by Inspector Küsthardt

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe not interrupted; most of ventral median stripe lost through taxidermy

Measurements: head–body: 2,32 m
tail: 0,42 m
ear: 0,16 m
hindfoot: 0,46 m
shoulder height: 1,17 m

State of preservation: much cracked; specimen very light, probably faded

Further material of same individual: upper and lower incisivae in collection

Remarks: not exhibited

References: Wagner (1835); Renshaw (1904); Ridgeway (1909); Hilzheimer (1912); Antonius (1931, 1951)

MUNICH—skull

Catalogue number: AM 541a

Sex: female

Locality: ——

Date of acquisition: 1834–5

Remarks on acquisition: bought from C. F. Ecklon, Hamburg, together with skin

State of preservation: occipital missing

Further material of same individual: ——

References: Hilzheimer (1912)

MUNICH—upper and lower incisivae

Catalogue number: AM 561

Sex: male

Locality: ——

Remarks on acquisition: ——

Further material of same individual: ——

NEW HAVEN—skeleton

Catalogue number: Osteology 1623 (490)

Sex: female

Locality: given as 'Syria (?)'

Date of acquisition: 1873

Remarks on acquisition: bought by O. C. Marsh from Edw. Gerrard, London; of same animal as mounted skin at Edinburgh

State of preservation: some molars missing

Remarks: not articulated, cleaned 1923

References: Willoughby (1966)

PARIS—mounted skin and skeleton

FIG. 17. Paris quagga.

Catalogue number: not registered

Sex: male

Locality: Cape Colony

Date of acquisition: probably 1798

Remarks on acquisition: animal arrived at the Gardens of the King at Versailles in 1784 from the Cape Colony; was transferred to Paris (Jardin des Plantes) in 1793 or 1794 (Dorst 1952)

History of mount: original mount, mainly of wood

Description of striking features: face clearly striped; mane short; sudden change from dorsal colour to leg colour at elbow; light flanking bands of dorsal

median stripe not interrupted; tail brush very long (0,49 m beyond tip of tail), most probably not original as fixing on to tail can be seen; skin of chestnuts on front legs replaced by white-haired skin

Measurements: head–body: 1,93 m
tail: 0,29 m
ear: 0,15 m
hindfoot: 0,43 m
shoulder height: 1,18 m

State of preservation: good

Further material of same individual: there is an articulated skeleton (No A544) labelled 'Quagga' in the Department of Comparative Anatomy, Paris Museum. It is not certain whether it belongs to the skin.

Remarks: not exhibited, stored in glass case

References: Desmarest (1820); Renshaw (1904); Trouessart (1906); Pocock (1907); Ridgeway (1909); Griffini (1913); Antonius (1931); Dorst (1952)

PHILADELPHIA—skeleton

Catalogue number: ANS 6317

Sex: male

Locality: ——

Date of acquisition: 1898

Remarks on acquisition: donated by Professor E. D. Cope

References: Renshaw (1904)

PRETORIA—skull

Catalogue number: TM 10161

Sex: female

Locality: ——

Date of acquisition: 'long ago'

Remarks on acquisition: identified in old collection by Lundholm

State of preservation: complete

References: Lundholm (1951)

STOCKHOLM—mounted skin

FIG. 18. Stockholm quagga foetus.

Catalogue number: Mam Ex. 14

Sex: foetus

Locality: Cape Coiony

Date of acquisition: 1775

Remarks on acquisition: brought to Sweden by A. Sparrman

History of mount: original mount of straw; repairs with two hand-sized white leather patches might be of later date

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe not interrupted; interspaces fairly wide

Measurements:

head–body:	1,020 m
tail:	0,171 m
ear:	0,074 m
hindfoot:	0,230 m
shoulder height:	0,520 m

State of preservation: fair, mane almost lost

Further material of same individual: ——

Remarks: a good painting of specimen was made about 1908 by S. Ekblom

References: Renshaw (1904); Ridgeway (1909); Lönnberg (1910); Antonius (1931)

STUTTGART—skull

Catalogue number: 16884

Sex: female

Locality: ——

Date of acquisition: 1827

Remarks on acquisition: donated by Baron C. F. H. von Ludwig of Cape Town, probably belonging to skin which was sent to Darmstadt in 1830

State of preservation: complete

References: Hilzheimer (1912); Antonius (1951); Sheer *in lit.* (1959)

TRING—mounted skin

FIG. 19. Tring quagga.

Catalogue number: 394830

Sex: appears to be female; two large nipples present, vulva skin forming hump

Locality: ——

Date of acquisition: 1889

Remarks on acquisition: bought by Lord Rothschild from Edw. Gerrard, London

History of mount: re-mounted by Edw. Gerrard before 1889

Description of striking features: face fairly striped; light flanking bands of dorsal median stripe much interrupted; ventral median stripe starting at last neck stripe

Measurements:

head–body:	2,37 m
tail:	0,37 m
ear:	0,18 m
hindfoot, left:	0,48 m
hindfoot, right:	0,47 m
shoulder height:	1,19 m

State of preservation: good

Further material of same individual: skeleton was mounted at Amsterdam in 1855—now lost (Tuijn 1966)

Remarks: exhibited

References: Sclater (1901); Pocock (1904); Ridgeway (1909); Griffini (1913); Antonius (1931); Tuijn (1966)

TÜBINGEN—skull

Catalogue number: 488

Sex: male

Locality: ——

Date of acquisition: 1842–50

Remarks on acquisition: Baron C. F. H. von Ludwig sent a quagga from South Africa to Tübingen in 1827 (Hilzheimer 1912)

State of preservation: occipital region missing

Remarks: The female quagga skull at Stuttgart is catalogued as: '1827 Von Ludwig, Kapkolonie' which leaves the origin of the Tübingen skull unknown, although it may possibly be one of the two quaggas formerly in the menagerie of Friedrich I, King of Württemberg

TURIN—mounted skin and skull

Catalogue number: 295?

Sex: female

Locality: ——

Date of acquisition: 1827

Remarks on acquisition: specimen bought from dealer S. Leadbeater, London; it is possible that this is the first of the three quaggas received by the Rijksmuseum van Natuurlijke Historie at Leiden between 1827 and 1833 from their agent at Cape Town, Dr H. B. van Horstok

History of mount: original mount with several old repairs especially on head and lumbar region

Description of striking features: face clearly striped; light flanking bands of dorsal median stripe, where visible, not interrupted

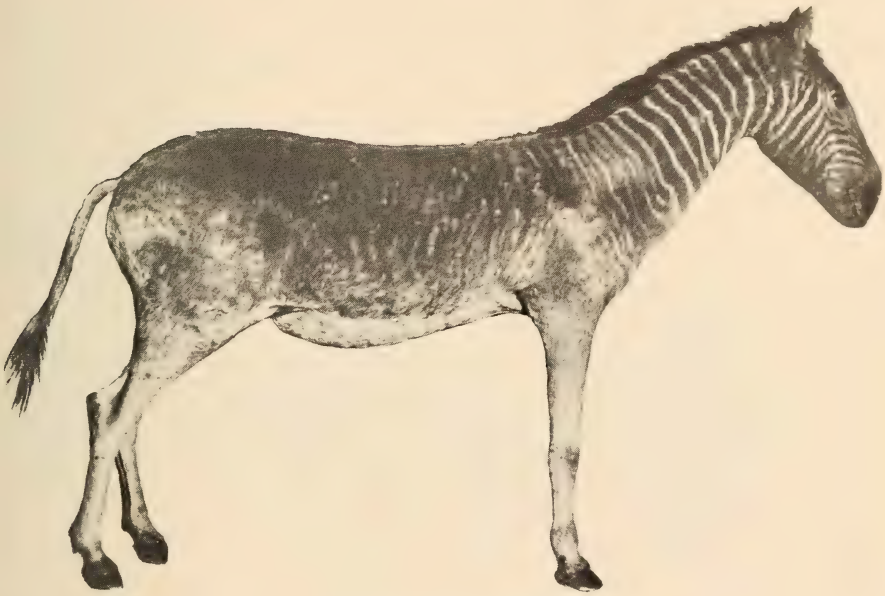

FIG. 20. Turin quagga.

Measurements: head–body: 2,45 m
tail: 0,47 m
ear: 0,17 m
hindfoot: 0,49 m
shoulder height: 1,19 m

State of preservation: fair, rather dirty, with rusty patches on legs

Further material of same individual: skull (No 295) in collection

Remarks: not exhibited; stored in glass case

References: Camerano (1902, 1908); Renshaw (1904); Ridgeway (1909); Hilzheimer (1912)

VIENNA—mounted skin

Catalogue number: NMW—St. 710 (old number 1834/II/10)

Sex: female

Locality: ——

Date of acquisition: April 1834

Remarks on acquisition: bought from C. F. Ecklon, Hamburg; Ecklon is known mainly for collecting botanical specimens in the Cape Colony, from where he returned to Hamburg several times

History of mount: original mount, like Paris specimen, mainly of wood

Description of striking features: specimen is the biggest of all preserved skins and obviously stretched as can be seen from the unusual width of both dorsal and ventral median stripes. Face clearly striped; light flanking bands of dorsal median stripe indicated only in anterior portion; in lumbar region light dots unite to form irregular continuous bands; stripe fragments below fork of shoulder stripe; body extensively striped; hair from striped areas with light and dark transverse sections

FIG. 21. Vienna quagga.

Measurements:

head–body:	2,490 m
tail:	0,420 m
ear:	0,185 m
hindfoot, left:	0,510 m
hindfoot, right:	0,530 m
shoulder height:	1,260 m

State of preservation: good, fading noticeable on left side of head and neck

Further material of same individual: ——

Remarks: not exhibited

References: Lorenz (1902); Renshaw (1904); Lydekker (1904); Ridgeway (1909); Griffini (1913); Antonius (1931)

WIESBADEN—mounted skin

FIG. 22. Wiesbaden quagga.

Catalogue number: 442

Sex: male

Locality: ——

Date of acquisition: 1865

Remarks on acquisition: bought from dealer Frank, Amsterdam; probably third London Zoo quagga (Sclater 1901)

History of mount: original mount

Description of striking features: face faintly striped; body stripes with light dots; dorsal portion of body striping continuing transversely almost to root of tail, resembling gridiron pattern of *Equus zebra*; light flanking bands of dorsal median stripe sometimes slightly interrupted; tail-brush thick and very long; upper edge of hooves covered with long hair

Measurements:

head–body:	2,30 m
tail:	0,41 m
ear:	0,16 m
hindfoot:	0,49 m
shoulder height:	1,20 m

State of preservation: fair; shrinkage has caused the opening of seams and several cracks in the skin, especially of the right side.

Further material of same individual: it is considered that the skeleton at the British Museum (Natural History), London, belongs to this individual

Remarks: exhibited

References: Anon (1858); Ridgeway (1909); Hilzheimer (1912); Antonius (1931)

FIG. 23. Doncaster; apparent quagga-hybrid foal.

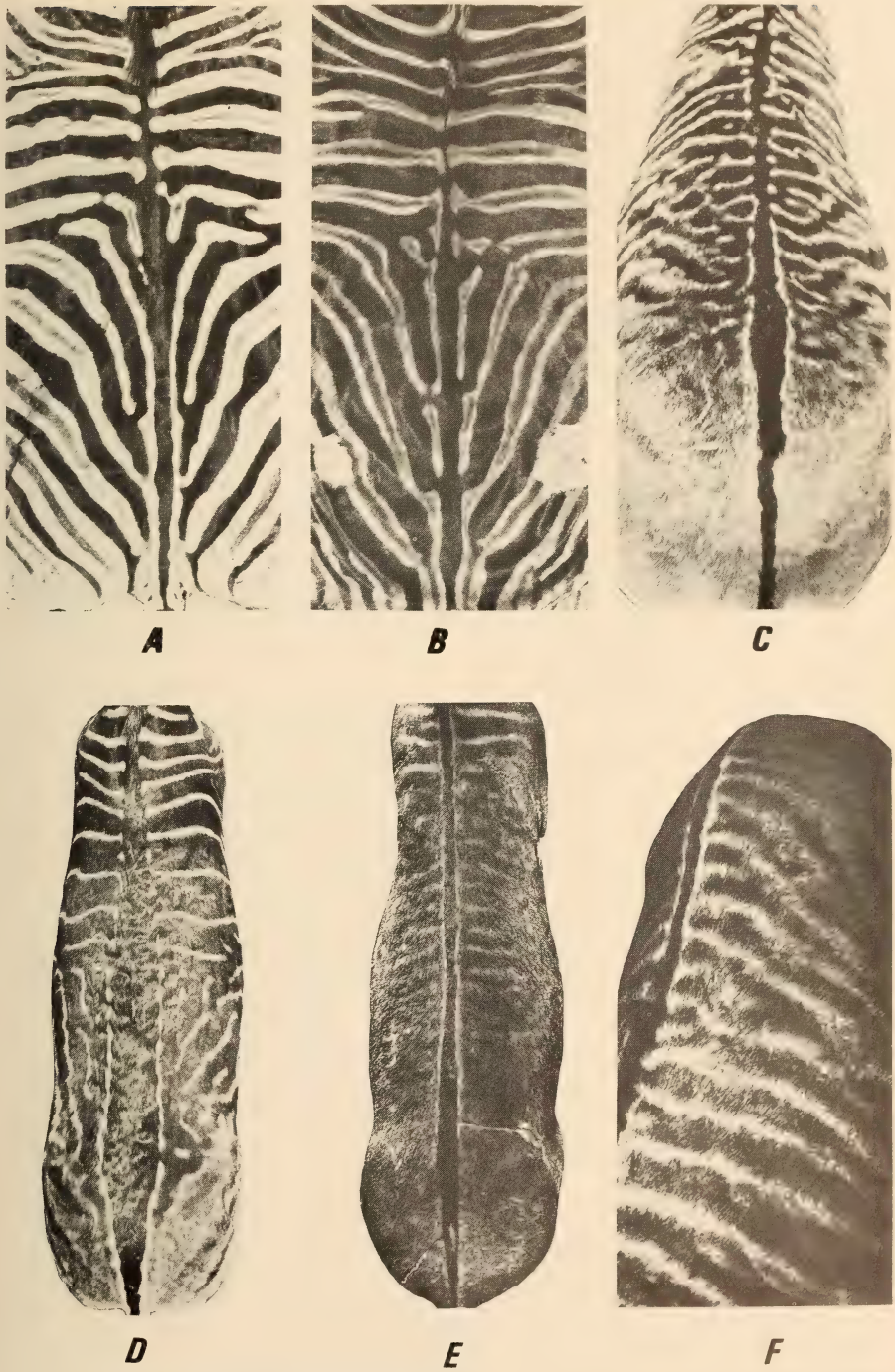

FIG. 24. Dorsal patterns of: A & B. Plains zebras from Zululand; note narrow anterior portion of dorsal median stripe and its indicated flanking bands. C. Tring quagga; note broader median stripe and its intensified flanking bands. D. Vienna quagga; animal appears stretched through taxidermy, which accounts for the excessive width of the dorsal median stripe; flanking bands further intensified. E. Munich quagga; note the continuous flanking bands. F. Wiesbaden quagga; note unusual extent of transverse stripes on rump.

FIG. 25. Successive decrease of stripes in members of the plains zebra group; from left, Cape Town quagga foal, Mainz male quagga; Mainz female Burchell's zebra; three plains zebras in Zululand; two East African plains zebras at Berlin Zoo.

ERRATUM

FIG. 25. To read: Successive increase . . .

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